3.1 Geology and Soils

Review of EIS Section and Previous Analysis

The geology and soils discipline team reviewed the Earth section of the 1992 Final EIS with respect to the current WSDOT standards and practices. This review indicated that the previous analysis and findings are generally in accordance with current WSDOT policy, as indicated in Section 420 of the *Environmental Procedures Manual* (WSDOT 2005e) and Section 510 of the *Design Manual* (WSDOT 2005b). In addition, we reviewed the following documents:

- *Draft Soil and Geology Report: SR 202 Improvement Project: SR 520 to Sahalee Way NE,* HWA Geosciences, Inc., November 1988
- *Geotechnical Recommendations, SR 202 Improvement Project: SR 520 to Sahalee Way NE,* WSDOT Environmental and Engineering Programs Geotechnical Division, November 2004
- *Preliminary Geotechnical Information for Wetland Mitigation and Detention Ponds: SR 520 to Sahalee Way NE*, WSDOT Environmental and Engineering Programs Geotechnical Division, December 2002
- *Soil Survey of King County Area, Washington,* Natural Resources Conservation Service (NRCS), formerly Soil Conservation Service (SCS), November 1973
- Stormwater pond borings H-1-05, P-1-05, and P-2-05, WSDOT Northwest Region Materials Lab, April 27 and 28, 2005
- *Geologic Map of the Redmond Quadrangle, King County, Washington*, U.S. Geological Survey (USGS) Source Map MF-2016: Scale 1:24,000, James P. Minard and Dereck B. Booth, 1988

Methodology

The geology and soils discipline team compared the methodology, affected environment, impacts, and mitigation measures identified in the 1992 Final EIS with current standards and site conditions to ensure that that information is up-to-date for the current work. The geology and soils discipline team reviewed WSDOT design manuals, current geologic mapping, soil survey mapping, and recent subsurface investigations for projects in the general vicinity of this project's improvements; the team also reviewed WSDOT's policy on erosion control for changes that might have occurred since 1992.

Coordination Efforts

Coordination with project design engineers provided updated information on the amount and location of fill associated with construction of the project improvements. This coordination also provided an accurate measure of the amount of new imperious surface that would be added as a result of the project improvements.

Affected Environment

Study area topography, site soils, stratigraphy, and geologic hazards have not changed since the 1992 Final EIS. In 2001, a magnitude 6.8 earthquake occurred at Nisqually (near Olympia, Washington); no effects from this event were observed in the study area, and no new faults were identified. The Groundwater section of the 1992 Final EIS identified a nearby City of Redmond well with groundwater 41 feet below the ground surface (bgs). Recent geotechnical borings within the project footprint indicate groundwater is approximately 20 feet bgs.

Impacts

As stated in the 1992 Final EIS, grading would modify the existing site topography. Construction activities would expose both native soil and previous fill to the potential for wind and water erosion; there is also the potential that eroded material could leave the construction site due to these erosion factors. Fill material either from on-site excavation activities or from a commercial pit site would be required. Locations for temporarily stockpiling material would be determined either during the final project design or would be proposed by the contractor after the project contract has been awarded.

As stated in the 1992 Final EIS, the combination of additional fill and impervious surface associated with the project would minimally affect aquifer recharge in the project area due to the aquifer size and the abundance of surface water available for recharge; that condition continues to be true. The excavation dewatering required for removing any compressible soils might temporarily affect the groundwater level in a localized area, but it would not affect the City of Redmond well located west of the interchange.

Mitigation Measures

Mitigation measures would be the same as those described in the 1992 Final EIS. These measures include drilling specific locations of bridge foundations and retaining walls to determine if unsuitable soils exist and removing unsuitable soils or using special engineering measures, such as preloading, to control settlement before structure construction.

Current WSDOT policy (WSDOT 2005d) mandates that the locations of temporary material stockpiles be reviewed by WSDOT design and permit staff to ensure that they are not placed in sensitive areas. All wetland, wetland buffer, and stream buffer boundaries would be clearly identified on the project plans to prevent placing stockpiles or waste material, staging areas, or

possible truck tire-washing stations in environmentally sensitive areas. A stormwater plan, which includes a temporary erosion and sediment control (TESC) plan, would be developed to identify site-specific measures that would be used to prevent erosion and confine and treat stormwater before it leaves the project site. The stormwater plan would also disclose which best management practices (BMPs) would be selected to lessen the effects of dust and debris on roads in the immediate project vicinity during construction (see further discussion in the Sections 3.2, Air Quality, and 3.3, Water Quality).